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(54) Title: DEVICE AT JAW CRUSHERS

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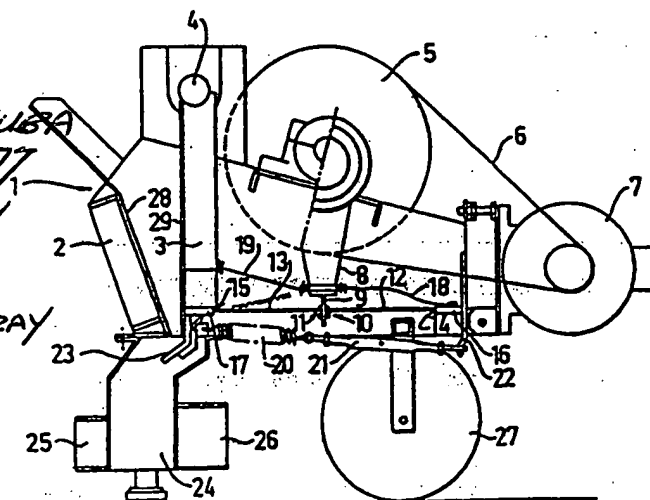
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(57) Abstract

Device at jaw crushers to ensure crushing of the added material down to a certain particle dimension. The device is especially used with crushing of demolition material to overcome dust problems when a suction transport system is employed. As the dimension of the conduits included therein must be kept down in order that the power required should not be too great the particles must be of a certain fraction. The invention is characterized in that immediately beneath the jaws (2, 3; 2' 3') of the crusher means (23) are arranged for preventing material of a certain dimension from leaving the space between the jaws (2, 3) or means (30, 33) for carrying out further subdivision of the material coming out from the jaws (2', 3').

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Device at jaw crushers

This invention relates to a device at jaw crushers to ensure crushing down to a certain particle dimension.

5 An increasing share of the total building activities concerns today rebuilding and restoration work of old buildings. At such work demolition masses such as brick, concrete, light concrete, clinker stones etc. must be transported away. The known technique of transporting away said demolition masses means that
10 the masses are first manually transported on a barrow to a chute/elevator or that the masses are carried away manually by the aid of a yoke.

Besides the fact that the work is physically extraordinarily hard, an extremely unhealthy working
15 environment arises due to dust formation.

The need of a merely brick demolition on attics comprises a yearly area of 0,5-1 million m² in Sweden. This means that yearly approx. 20 000 t brick is demolished and transported away manually only in
20 Sweden.

It is the object of this invention to provide a device at jaw crushers which ensures that the particle size of the crushed material does not exceed a certain value. The crusher should preferably give a
25 material of 0-35 fraction.

The reason for the particle size lying within a certain range is that the crushed material is carried away by means of a suction transport system, whereby the conduits included therein must have a limited
30 diameter as otherwise the required power need will be too great.

This object of the invention is realized by means of a device which has been given the characteristic features defined in the accompanying drawings.

An illustrative example of the invention will be described below with reference to the enclosed drawings, where Fig. 1 is a schematic lateral view of a jaw crusher, which is provided with a device according to the invention; Fig. 2 shows also a jaw crusher which is provided with an alternative embodiment of the device according to the invention.

The jaw crusher shown in Fig. 1 is of so-called dual plate type.

Said jaw crusher has a frame 1 on which a stationary jaw 2 is arranged as well as a movable jaw 3, which at its upper end is pivotably connected to a stationary shaft 4 supported by the frame 1.

A flywheel 5 is arranged on the frame 1, said flywheel 5 being rotated via a belt 6 which is driven by an electric motor 7 also disposed on the frame.

A connecting rod 8 is eccentrically mounted on the flywheel 5. At the lower end of the connecting rod 8 there is arranged a bracket means 9 projecting downwards, which is provided at opposed sides with horizontally running grooves 10 and 11, respectively. In these grooves 10, 11 breaking plates 12, 13 are received, the opposite ends of which are received in grooves 14, 15 of guide means 16 and 17, respectively, one of which 16 is placed on the frame 1 while the other 17 is disposed on the movable jaw 3.

Above the breaking plates 12, 13 two rubber cloths 18, 19 are arranged, which are attached to the connecting rod 8 with one of their ends while their opposite ends are connected to guide means 16 and the movable jaw 3, respectively. The function of the rubber cloths 18 and 19 is to prevent soiling of the breaking plates 12, 13 resulting in possible functional disorder.

As the breaking plates 12, 13 are only loosely received in the grooves it is necessary with a permanent force pressing the movable jaw 3 against the stationary guide means 16. This force is achieved by a force exerting means in the form of a tensile spring 20 attached to the lower end of the movable jaw and a rigging screw 21 connected to the spring 20, which is connected at its end turned away from the spring 20 to a bracket 22 attached to the frame 1. An adjustable force that holds the breaking plates 12, 13 together can be applied to the latter by this construction.

At the lower end of the movable jaw 3 there is arranged a tongue 23 extending obliquely downwards from the lower end of the movable jaw 3. The function of the tongue 23 will be described below.

Beneath the lower ends of the jaws 2, 3 a collection space 24 for the crushed material is arranged, said space 24 having discharge ports 25, 26 to which a suction line included in a suction transport system can be connected.

As is apparent from Fig. 1 the frame is supported by a wheel 27, the crusher thus being movable.

Although not shown in Fig. 1 the crushing plates 28, 29 of the jaws are provided with grooves placed substantially in a vertical plane, the opposed grooves being displaced relative to each other for a better coacting crushing function of the jaws.

The device described above operates as follows.

The material to be crushed is fed downwards in suitable portions between the jaws 2, 3. By rotation of the flywheel 5 by means of the drive belt 6 and the motor 7 the connecting rod 8 will move the close ends of the breaking plates 11, 12 vertically. The movable jaw 3 will then perform a movement like a pendulum

around the shaft 4, the action of the spring 20 ensuring that the breaking plates 11, 12 are retained in their grooves. At said movement the downwardly fed material is crushed. By the embodiment of the crushing plates with vertical grooves there is a risk that staff-shaped elements of such a length remain after crushing that they cannot be taken charge of by the suction system. However, these staff-shaped elements cannot pass down into the collection space 24, if they have a certain length, due to the existence of the tongue 23. Said staff-shaped elements will thus be caught by the tongue, after which they are exposed to another crushing cycle, which then means that they are broken and can pass the tongue 23 down into the space 24. The elements thus broken have now obtained such a dimension that they can be taken charge of by the suction system.

The jaw crusher shown in Fig. 2 of dual plate type agrees completely with the crusher according to Fig. 1 except in one respect.

As is apparent from Fig. 2 a subdividing means in the form of knives 32 placed on a rotary shaft 31 is arranged beneath the jaws 2', 3'. These knives 32 cooperate with stationary stop means 33. This embodiment operates in such a way that when crushed material is fed out of the jaws 2', 3' it is caught by the knives 31 of the rotary subdividing means and are further crushed against the stop means 33. Thereafter the material will fall down into the space 24' to be conveyed further by means of the suction transport system.

In this connection it should be pointed out that the suction transport system creates a negative pressure in the space 24, 24', which is also propagated

to a certain extent up to the range of the jaws 2, 3;
2', 3'. This means that the dust formed at crushing of
material is taken charge of by the suction transport
system, and therefore a substantially better working
5 environment is created than is the case when known
technique is used.

This invention is by no means limited to the use
with pendulum crushers of dual plate type. Thus, it can
also be used with so-called rotary crushers of single
10 plate type. This applies both to the embodiment accor-
ding to Fig. 1 and the embodiment according to Fig. 2.

Accordingly, the invention can be freely varied
within the scope of the accompanying claims.

PATENT CLAIMS

1. A device at jaw crushers to ensure crushing of the added material down to a certain particle dimension, characterized in that immediately beneath the jaws (2,3:2'3') of the crusher means (23) are arranged for preventing material of a certain dimension from leaving the space between the jaws (2, 3) or means (30, 33) for carrying out further subdivision of the material coming out from the jaws (2', 3').

2. The device of claim 1, characterized in that the preventing means comprises a tongue (23) disposed in the range of the lower ends of the jaws (2, 3), the free end of said tongue extending obliquely downwards.

3. The device of claim 2, characterized in that the tongue (23) is placed at a movable jaw (3) of the crusher.

4. The device of claim 1, characterized in that the subdividing means (30) comprises knives placed on a rotary shaft (31) and fixed stop means (33).

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FIG.1

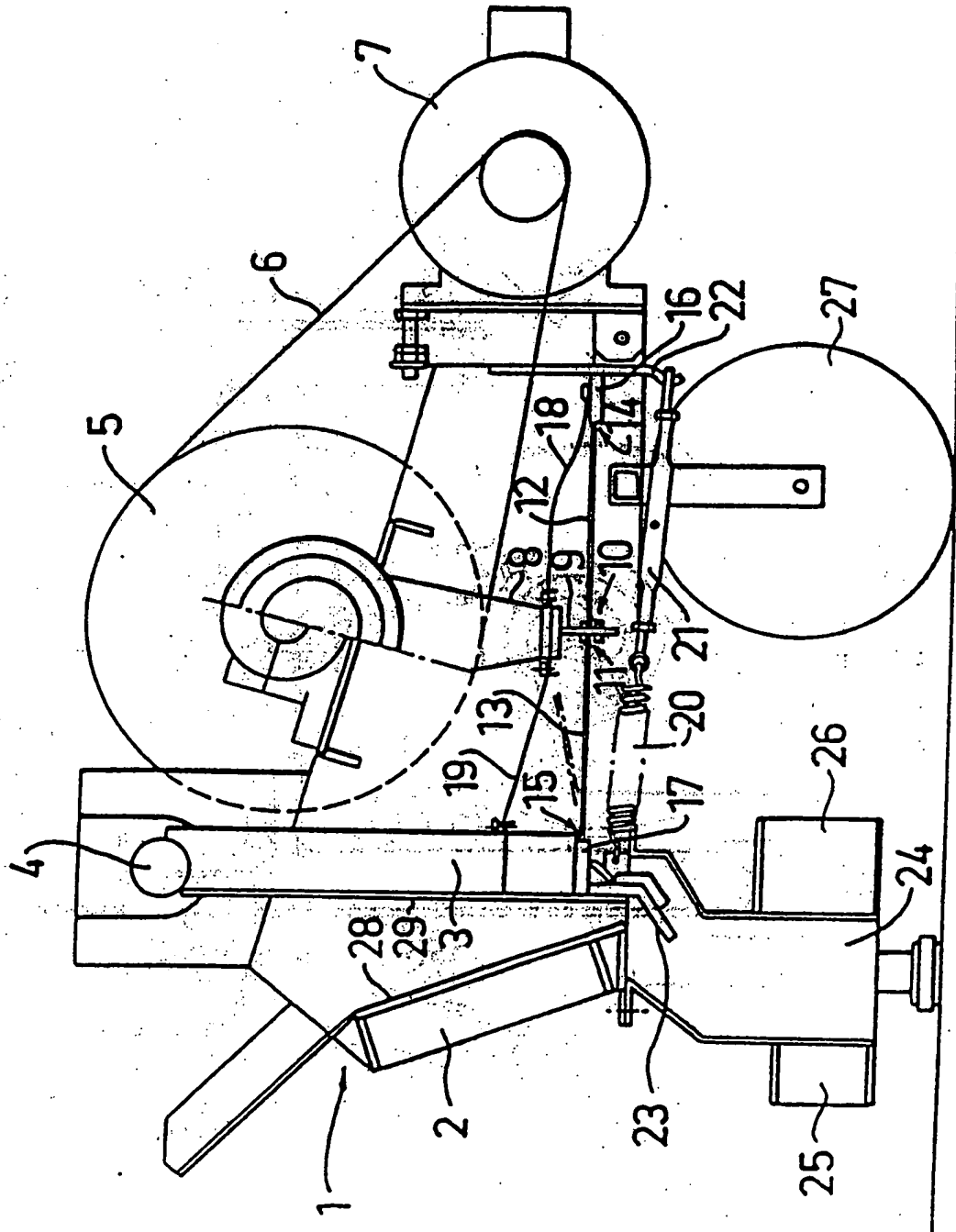
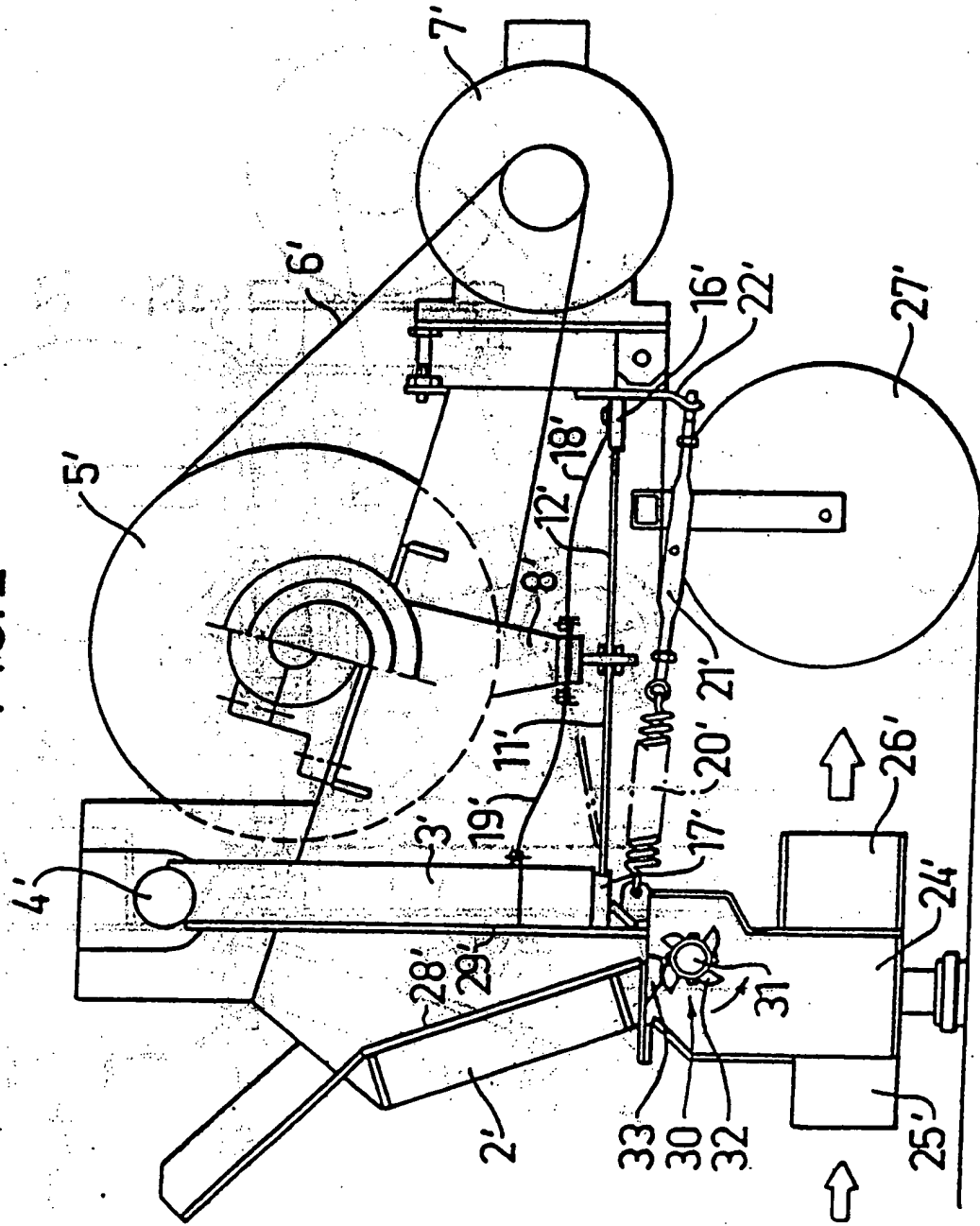


FIG. 2



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE85/00089

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) *

According to International Patent Classification (IPC) or to both National Classification and IPC 4

B 02 C 1/02

II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC 4	B 02 C 1/00-08
Nat C1	50c:1/01,10,20
US C1	241:32, 36, 139, 140, 142, 148, 217-219, 262-269, 300

Documentation Searched other than Minimum Documentation
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SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT *

Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages **	Relevant to Claim No. **
X	GB, A, 372 645 (ANTON GJELSTAD) 12 May 1932	1, 4
X	GB, A, 441 906 (WILLIAM ARTHUR HISCOX) 29 January 1936 see fig 2 and page 4, lines 65-75 & DE, 650608 FR, 799041 SE, 87633	1-3
X	SE, C, 59 850 (A H ABERG) 5 August 1922	1
A	US, A, 645 586 (M G BUNNELL) 20 March 1900 see fig 5	1-3
X	US, A, 1 578 948 (J R BAKSTAD) 30 March 1926	1
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IV. CERTIFICATION

Date of the Actual Completion of the International Search

1985-04-30

Date of Mailing of this International Search Report

1985-05-06

International Searching Authority

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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
X	US, A, 4 406 416 (ISAO TATEISHI) 27 September 1983 see column 4, lines 10-16	1

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